

# SERIES HR25

# Dynapar™ brand

## Shafted Encoder

### Key Features

- **Reliable Dual Row Bearing Design**
- **Unbreakable Code Disc**
- **Industry Standard Size 25 (2.5")**

CE



## SPECIFICATIONS

### STANDARD OPERATING CHARACTERISTICS

**Code:** Incremental

**Resolution:** 1 to 1024 PPR (pulses/revolution)

**Accuracy:** (Worst case any edge to any other edge)  $\pm 7.5$  arc-min.

**Format:** Two channel quadrature (AB) with optional Index (Z) and complementary outputs

**Phase Sense:** A leads B for CW or CCW shaft rotation as viewed from the shaft end of the encoder; see Ordering Information

**Quadrature Phasing:**  $90^\circ \pm 22.5^\circ$  electrical

**Symmetry:**  $180^\circ \pm 18^\circ$  electrical

**Index:**  $180^\circ \pm 18^\circ$  electrical (gated with B low)

**Waveforms:** Squarewave with rise and fall times less than 1 microsecond into a load capacitance of 1000 pf

### ELECTRICAL

#### Input Power:

4.5 min. to 26 VDC max. at 80 mA max., not including output loads

#### Outputs:

7273 Open Collector: 30 VDC max., 40 mA sink max.

7272 Push-Pull and Differential Line Driver: 40 mA sink or source

4469 Differential Line Driver: 100 mA, sink or source

**Frequency Response:** 100 kHz min.

**Electrical Protection:** Overvoltage, reverse voltage and output short circuit protected

**Noise Immunity:** Tested to EN61326 (Industrial) for Electro Static Discharge, Radio Frequency Interference, Electrical Fast Transients, Conducted and Magnetic Interference

### CONNECTIONS

#### Mating Connector:

7 pin, style MS3106A-16S-1S (MCN-N5);

10 pin, style MS3106A-18-1S (MCN-N6)

5 pin, style M12: Cable with connector available

8 pin, style M12: Cable with connector available

### MECHANICAL

**Shaft Loading:** (at 0.25" from encoder face) 80 lbs. radial, 80 lbs. axial

**Shaft Speed:** 10,000 RPM max.

**Shaft Runout:** 0.001" max. TIR

**Moment of Inertia:**  $3.0 \times 10^{-4}$  oz-in-sec<sup>2</sup>

### ENVIRONMENTAL

#### Operating Temperature:

Standard: 0 to +70 °C;  
Extended: -40 to +85 °C

**Storage Temperature:** -40 to +90 °C

**Shock:** 50 G's for 11 milliseconds duration

**Vibration:** 5 to 2000 Hz at 20 G's

**Humidity:** to 98% without condensation

#### Enclosure Rating:

HR525: NEMA12/IP54 (dirt tight, splashproof);  
HR625: NEMA4/IP66 (dust proof, washdown)



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## Ordering Information

To order, complete the model number with code numbers from the table below:

Code 1: Model	Code 2: PPR	Code 3: Mechanical	Code 4: Output	Code 5: Electrical	Code 6: Termination	Code 7: Options
HR <input type="checkbox"/> 25	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>

Ordering Information						
<b>HR525</b> Size 25 Enclosed, Shielded Bearings <b>HR625</b> Size 25 Enclosed, with Shaft Seal	<b>0001 0250</b> <b>0005 0256</b> <b>0010 0300</b> <b>0012 0360</b> <b>0050 0400</b> <b>0060 0500</b> <b>0086 0512</b> <b>0100 0600</b> <b>0120 0635</b> <b>0125 0800</b> <b>0180 0900</b> <b>0200 1000</b> <b>0240 1024</b>	<b>0</b> Flange Mount, 3/8" Shaft <b>1</b> 2.50" Servo Mount/ 4 Hole, 2.00" BC Face Mount, 3/8" Shaft <b>2</b> Flange Mount, 1/4" Shaft <b>3</b> 2.50" Servo Mount/ 4 Hole 2.00" BC Face Mount, 1/4" Shaft <b>4</b> 2.50" Servo Mount/ 3 Hole, 2.00" BC Face Mount, 3/8" Shaft <b>5</b> 2.50" Servo Mount/ 3 Hole, 2.00" BC Face Mount, 1/4" Shaft <b>6</b> 2.50" Servo Mount/ 3 Hole, 1.88" BC Face Mount, 3/8" Shaft <b>7</b> 2.50" Servo Mount/ 3 Hole, 1.88" BC Face Mount, 1/4" Shaft <b>8</b> 2.62" Servo Mount/ 3 Hole, 1.88" BC Face Mount, 3/8" Shaft <b>9</b> 2.62" Servo Mount/ 3 Hole, 1.88" BC Face Mount, 1/4" Shaft	<b>7 Pin Connector or Cable</b> <b>0</b> Single Ended, no Index, Format A, Table 2 <b>1</b> Single Ended, with Index, Format A, Table 2 <b>4</b> Single Ended, with Index, Format B, Table 2 <b>6</b> Differential, no Index, Format C, Table 3 <b>A</b> Single Ended, with Index, Format C, Table 2 <b>C</b> Single Ended, no Index, Format C, Table 2 <b>G</b> Single Ended, with Index, Format D, Table 2	<b>0</b> 5-26V in; 5-26V Open Collector with 2.2kΩ Pullup out <b>1</b> 5-26V in; 5-26V Open Collector out <b>2</b> 5-26V in; 5V Totem Pole out <b>3</b> 5-26V in; 5V Line Driver out (7272) <b>4</b> 5-26V in; 5-26V Line Driver out (7272) <b>5</b> 5-26V in, 5V Differential Line Driver out (4469) <b>6</b> 5-15V in, 5- 15V Differential Line Driver out (4469) <b>A</b> Same as "0" with extend. temp range <b>B</b> Same as "1" with extend. temp range <b>C</b> Same as "2" with extend. temp range <b>D</b> Same as "3" with extend. temp range <b>E</b> Same as "4" with extend. temp range	<b>0</b> End Mount Connector <b>1</b> Side Mount Connector <b>2</b> 18" Cable, Side <b>3</b> 3' Cable, Side <b>4</b> 6' Cable, Side <b>5</b> 10' Cable, Side <b>6</b> 15' Cable, Side <b>J</b> 18" Cable, End <b>K</b> 3' Cable, End <b>L</b> 6' Cable, End <b>M</b> 10' Cable, End <b>N</b> 15' Cable, End	available when Code 4 is 0 thru G, and Code 6 is 0 or 1:  <b>PS</b> LED Output Indicator
			<b>10 Pin Connector or Cable</b> <b>2</b> Differential, no Index, Format A, Table 1 <b>3</b> Differential, with Index, Format A, Table 1 <b>5</b> Differential, with Index, Format B, Table 1 <b>B</b> Differential, with Index Format C, Table 1 <b>D</b> Differential, no Index, Format C, Table 1	<b>5 Pin M12 Connector</b> <b>H</b> Single ended, no index, Format A, Table 4 <b>J</b> Single ended, with index, Format A, Table 4 <b>K</b> Single ended, with index, Format B, Table 4 <b>L</b> Single ended, with index, Format C, Table 4 <b>M</b> Single ended, no index, Format C, Table 4 <b>N</b> Single ended, with index, Format D, Table 4	<b>8 Pin M12 Connector</b> <b>P</b> Single ended, no index, Format A, Table 5 <b>Q</b> Single ended, with index, Format A, Table 5 <b>R</b> Single ended, with index, Format B, Table 5 <b>S</b> Single ended, with index, Format C, Table 5 <b>T</b> Single ended, no index, Format C, Table 5 <b>U</b> Single ended, with index, Format D, Table 5 <b>V</b> Differential, no index, Format A, Table 6 <b>W</b> Differential, with index, Format A, Table 6 <b>X</b> Differential, with index, Format B, Table 6 <b>Y</b> Differential, with index, Format C, Table 6 <b>Z</b> Differential, no index, Format C, Table 6	available when Code 1 is HR625: <b>A</b> 18" Watertight, Side <b>B</b> 3' Watertight, Side <b>C</b> 6' Watertight, Side <b>D</b> 10' Watertight, Side <b>F</b> 15' Watertight, Side <b>P</b> 18" Watertight, End <b>Q</b> 3' Watertight, End <b>R</b> 6' Watertight, End <b>S</b> 10' Watertight, End <b>T</b> 15' Watertight, End

**10 foot Cable Assemblies with MS Connector**

- 1400431-0010** 7 Pin MS, Cable Assy. For Use with Single Ended w/Index Outputs
- 108596-0010** 7 Pin MS, Cable Assy. For Use with Differential Line Driver w/o Index Outputs
- 1400635-0010** 10 Pin MS, Cable Assy. For Use with Differential Line Driver with Index Outputs

**15 foot Cable Assemblies with M12 Connector**

- 112859-0015** 5 Pin M12, Cable Assy. For Use with Single Ended Outputs
- 112860-0015** 8 Pin M12, Cable Assy. For Use with Single Ended Outputs
- 112860-0015** 8 Pin M12, Cable Assy. For Use with Differential Line Driver Outputs

**Mating Connectors (no cable)**

- 7 pin, style MS3106A-16S-1S (MCN-N5)
- 10 pin, style MS3106A-18-1S (MCN-N6)

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## ELECTRICAL CONNECTIONS

### Prewired Cable or Accessory Cables with 7 or 10 Pin MS Connector - when Code 4= 0 to 6, or A, B, C, D or G

Note: Wire color codes are referenced here for models that are specified with pre-wired cable. Connector/cables are described in the Encoder Accessories section of this catalog and color-coding information is provided here for reference.

Pin	Function (If Used)	Wire Color Code	Cable* Accessory Color Code
A	Signal A	BRN	BRN
B	Signal B	ORN	ORN
C	Signal Z	YEL	YEL
D	Power Source	RED	RED
E	No Connection	—	—
F	Common	BLK	BLK
G	Case	GRN	GRN
H	Signal $\bar{A}$	BRN/WH	BRN/WH
I	Signal $\bar{B}$	ORN/WH	ORN/WH
J	Signal $\bar{Z}$	YEL/WH	YEL/WH

\*Cable Accessory: P/N 14006350010

Pin	Function (If Used)	Wire Color Code	Cable* Accessory Color Code
A	Signal A	BRN	RED
B	Signal B	ORN	BLUE
C	Signal Z	YEL	YEL
D	Power Source	RED	WHT
E	No Connection	—	GRN
F	Common	BLK	BLK
G	Case	GRN	SHIELD

\*Cable Accessory: P/N 14004310010

Pin	Function (If Used)	Cable Accessory Color Code
A	Signal A	BRN
B	Signal B	ORN
C	Signal $\bar{A}$	BRN/WHT
D	Power Source	RED
E	Signal $\bar{B}$	ORN/WHT
F	Common	BLK
G	Case	GRN

\*Cable Accessory: P/N 1085960010

**Cable Configuration:** PVC jacket, 105 °C rated, overall foil shield; 3 twisted pairs 26 AWG (output signals), plus 2 twisted pairs 24 AWG (input power)

### 5 & 8 Pin M12 Accessory Cables - when Code 4= H to Z

Connector pin numbers and cable assembly wire color information is provided here for reference.

Encoder Function	Table 4 5 Pin Single Ended		Table 5 8 Pin Single Ended		Table 6 8 Pin Differential	
	Pin	Wire Color	Pin	Wire Color	Pin	Wire Color
<b>Sig. A</b>	4	BLK	1	BRN	1	BRN
<b>Sig. B</b>	2	WHT	4	ORG	4	ORG
<b>*Sig. Z</b>	5	GRY	6	YEL	6	YEL
<b>Power +V</b>	1	BRN	2	RED	2	RED
<b>Com</b>	3	BLU	7	BLK	7	BLK
<b>Sig. <math>\bar{A}</math></b>	—	—	—	—	3	BRN/WHT
<b>Sig. <math>\bar{B}</math></b>	—	—	—	—	5	ORG/WHT
<b>*Sig. <math>\bar{Z}</math></b>	—	—	—	—	8	YEL/WHT

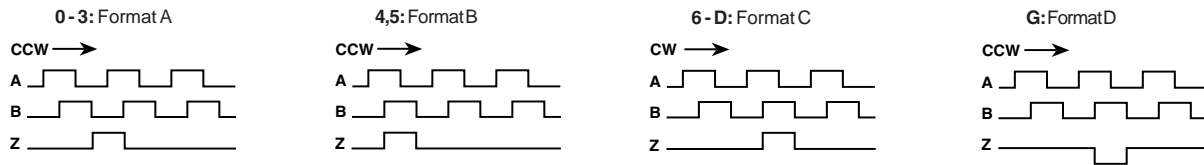
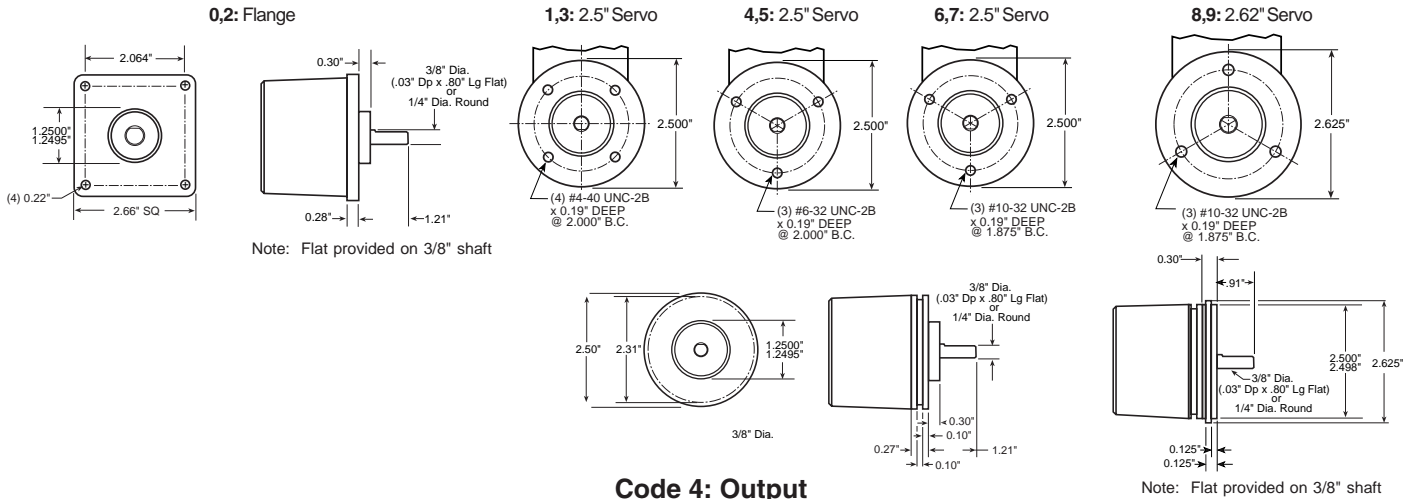
\* Index not provided on all models. See ordering information

**Cable Configuration:** PVC jacket, 105 °C rated, overall foil shield; 24 AWG conductors, minimum

See “Accessories” Section for Connectors and Cable Assemblies Ordering Information

## DIMENSIONS

### Code 3: Mechanical



### Code 6: Termination

